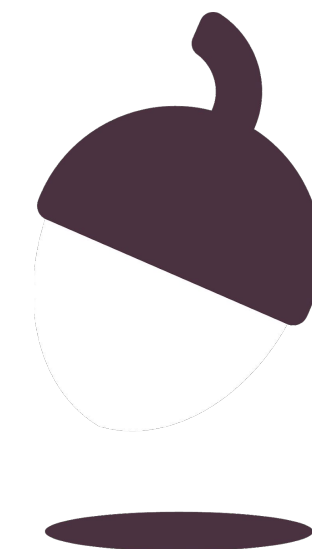


Combined Science HT- Biology - KS4
Homeostasis and Response

The Nervous System and Homeostasis

Review Lesson - Higher

Miss Ray



OAK
NATIONAL
ACADEMY

Copy and complete

State where the receptors to each of these stimuli are found:

<u>Stimulus</u>	<u>Location of receptors</u>
Light intensity	
Temperature	
Pressure	
Sound	



Answers

State where the receptors to each of these stimuli are found:

<u>Stimulus</u>	<u>Location of receptors</u>
Light intensity	Eyes
Temperature	Skin
Pressure	Skin
Sound	Ears





Skin receptor density

Location	Density (per mm ²)
Fingertips	5
Bicep	0.4
Thigh	0.05

In which location are the receptors found closest together?

Why are injections commonly given in the bicep or thigh?

The eye has a light receptor density of 8 per mm², the fingertips have a light receptor density of 0 per mm². What stimulus do each of these locations receive?

The eye also contains pressure receptors, why is this?



Answers

1. In which location are the receptors found closest together?

Fingertips

2. Why are injections commonly given in the bicep or thigh?

**The receptors are less dense/more spread out in these areas.
It will be less painful as less receptors will be stimulated.**



Answers

3. The eye has a light receptor density of 8 per mm^2 , the fingertips have a light receptor density of 0 per mm^2 . What stimulus do each of these locations receive?

Eye - light reflected into the eye

Fingertips - pressure/temperature

4. The eye also contains pressure receptors, why is this?

**Detect when something is in the eye that could potentially cause damage
e.g. an eyelash that has fallen into the eye.**



Explain why you think phantom limb pain occurs after a limb has been amputated.



Answer

- Brain may remap that part of the body's sensory circuitry to another part of the body.
- Damaged nerve endings
- Scar tissue





Copy and complete

	Nervous Control	Hormonal control
What is the signal?	Electrical	
How is it transported?		Blood stream
Where does it travel to?	Effectors (muscles or glands)	
How quick is this process?		Slow
How long does this process last?	Short lasting	
How widespread are the effects?		Effects are seen around the body





Copy and complete

	Nervous Control	Hormonal control
What is the signal?	Electrical	Chemical
How is it transported?	Neurones/nerve cells	Blood stream
Where does it travel to?	Effectors (muscles or glands)	Target cells/organs
How quick is this process?	Rapid	Slow
How long does this process last?	Short lasting	Long lasting
How widespread are the effects?	Localised	Effects are seen around the body



Receptors detect the change and send a signal to the coordination centre

Responses activated at the effectors/ target organs

Conditions return to normal and responses are switched off.

Normal body conditions

Condition increases

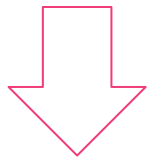
Condition decreases



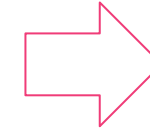
Condition
increases



Condition
decreases



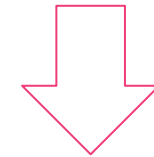
Receptors detect the
change and send a
signal to the
coordination centre



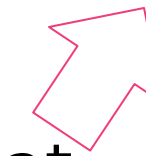
Responses activated
at the effectors/
target organs



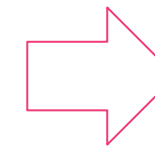
Conditions return to
normal and responses
are switched off.



Conditions return to
normal and responses
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Receptors detect the
change and send a signal
to the coordination centre



Responses activated at
the effectors/ target
organs

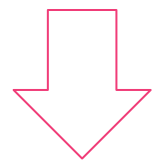
Normal body conditions



Glucose concentration increases



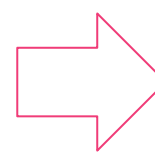
Normal blood glucose concentrations



Glucose concentration decreases



Receptors detect the change and send a signal to the coordination centre



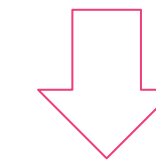
Response?



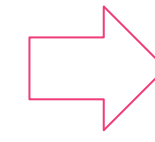
Conditions return to normal and responses are switched off.



Conditions return to normal and responses are switched off.



Response?



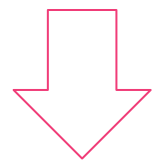
Receptors detect the change and send a signal to the coordination centre



Glucose concentration increases



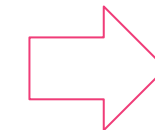
Normal blood glucose concentrations



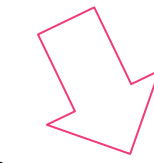
Glucose concentration decreases



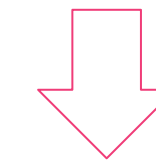
Receptors detect the change and send a signal to the coordination centre



The pancreas releases insulin. This stimulates the liver cells to convert glucose into glycogen.



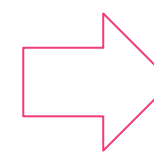
Conditions return to normal and responses are switched off.



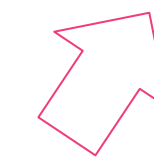
Conditions return to normal and responses are switched off.



Receptors detect the change and send a signal to the coordination centre



The pancreas releases glucagon. This stimulates the liver cells to convert glycogen into glucose..





Quick questions

1. Name a hormone that IS controlled by negative feedback.
2. Name a hormone that is NOT controlled by negative feedback.
3. True or false - negative feedback is a continuous cycle.
4. True or false - glycogen is insoluble.





Quick questions

1. Name a hormone that IS controlled by negative feedback. **Thyroxine**
2. Name a hormone that is NOT controlled by negative feedback. **Adrenaline**
3. True or false - negative feedback is a continuous cycle. **True**
4. True or false - glycogen is insoluble. **True**



Exam style questions

1. Explain the effect an insulin injection has on the body. [3]
2. Explain why the concentration of glucagon in the blood is higher when you wake up in the morning than after a meal. [4]



Exam style questions

1. Explain the effect an insulin injection has on the body. [3]

Insulin travels in the blood and stimulates the liver cells to convert glucose into glycogen. This reduces the blood glucose concentration.

2. Explain why the concentration of glucagon in the blood is higher when you wake up in the morning than after a meal. [4]

Glucagon is released by the pancreas when blood glucose concentrations are low. Blood glucose levels are low when you first wake up as it has been a long time since your last meal. Glucagon stimulates the liver cells to convert glycogen into glucose so that there is enough glucose for respiration to occur.

